

## ABSTRACT

Disclosed is a method of making a bismuth molybdate precursor solution using a metallorganic decomposition (MOD) process consisting of the formation of a precursor sol of hexanoates of Bismuth (Bi) and Molybdenum (Mo). The precursor solution is used to make thin film of Bismuth molybdate by spin coating and spray pyrolysis. The bismuth molybdate films have the useful alpha and gamma phases having high sensitivity to ethanol gas, the detection of the ethanol gas is based upon the change of electrical conductivity of a thick film of the semiconductor oxide sensing element resulting from the ethanol gas in an oxygen-containing atmosphere. When the drying is effected by spray pyrolysis, quite thick films with high adhesion have been produced over different substrates, including quartz. The thin film of the present invention made by spray pyrolysis has a very fast response to ethanol detection eg typically 5 seconds.